

AMENDMENTS TO THE CLAIMS

1-15. (Canceled)

16. (Currently amended) A multicarrier radio communication system comprising:

a first communication device that transmits a signal and includes

a transmitting antenna for each channel;

a by-channel known-signal generating unit that generates known signals by channels, the known signals being spread by a code orthogonal between channels;

a common known-signal generating unit that generates a common known signal that is common to the channels; and

a transmission-signal generating unit for each channel that generates a transmission signal for a corresponding channel by allocating user data, the common known signal, and the known signals by channels according to a prescribed frame format, the transmission signal being a signal to be transmitted via corresponding antenna; and

a second communication device that receives the signal from the first communication device and includes

a receiving antenna for each channel;

an initial synchronizing unit that establishes a timing synchronization and a frequency synchronization using the common known signal; and

a by-channel known-signal extracting unit that extracts the known signals by channels from a reception signal for each channel, which is a signal received via the receiving antenna, after establishing the timing synchronization; and

a despreading unit that despreads the reception signal with the orthogonal code based on information concerning the timing synchronization;

a matched filtering unit that calculates channel impulse responses by channels from the signal that is despreaded; and

a preceding-wave searching unit that determines a preceding wave position based on the channel impulse responses,

wherein the by-channel known signal extracting unit extracts the known signals by channels based on the preceding wave position.

17-24. (Canceled)

25. (Currently amended) A communication device for receiving a signal comprising:

a receiving antenna for each channel;

an initial synchronizing unit that establishes a timing synchronization and a frequency synchronization using a common known signal that are common among channels; and

a by-channel known-signal extracting unit that extracts known signals that is spread by a code orthogonal between the channels, by channels, from a reception signal for each channel, which is a signal received via the receiving antenna, after establishing the timing synchronization;

a despreading unit that despreads the reception signal with the orthogonal code based on information concerning the timing synchronization;

a matched filtering unit that calculates channel impulse responses by channels from the signal that is despreaded; and

a preceding-wave searching unit that determines a preceding wave position based on the channel impulse responses,

wherein the by-channel known signal extracting unit extracts the known signals by channels based on the preceding wave position.

26-30. (Canceled)